What we claim is:

1. An optical disc system, comprising:

a photo detector circuit of an optical disc drive configured to generate at least one information-carrying signal from an optical disc assembly; and

a signal processing system coupled to the photo detector circuit to obtain from said at least one information-carrying signal both operational information used to operate the optical disc system and indicia data indicative of a presence of an investigational feature associated with the optical disc assembly.

2. The optical disc system of claim 1 wherein the signal processing system includes a PC and analog-to-digital converter coupled between said at least one information carrying signal and the PC.

3. The optical disc system of claim 2 wherein said analog-to-digital converter provides a digitized signal and said PC includes a first program module to detect and characterize peaks in the digitized signal.

4. The optical disc system of claim 3 wherein said PC further includes a second program module to detect and count double peaks in the digitized signal.

5. The optical disc system of claim 2 wherein said signal processing system further includes an analyzer coupled between said analog-to-digital converter and the PC, said analog-to-digital converter provides a digitized signal, and said analyzer includes logic to detect and characterize peaks in the digitized signal.

6. The optical disc system of claim 5 wherein the analyzer further includes logic to detect and count double peaks in the digitized signal.

7. The optical disc system of claim 2 wherein the signal processing system further includes an audio processing module coupled between said at least one information-carrying signal and the analog-to-digital converter.

8. The optical disc system of claim 7 further comprising:

a predetermined sound recorded on said optical disc assembly; and

a program module in said PC for detecting said indicia data in a deviation of said at least one information carrying signal from the predetermined sound when the investigational feature is present.

9. The optical disc system of claim 8 wherein the predetermined sound is encoded silence.

10. The optical disc system of claim 2 wherein said signal processing system further includes a buffer coupled between said at least one information-carrying signal and said analog-to-digital converter.

11. The optical disc system of claim 2 wherein the signal processing system further includes a trigger detection circuit coupled to said analog-to-digital converter, said trigger detection circuit being operative to detect a particular time in relation to a time when said indicia data is present in said at least one information-carrying signal.

12. The optical disc system of claim 1 wherein the signal processing system includes a programmable digital signal processor selectively configurable to extract the operational information from said at least one information-carrying signal while in a first configuration and operate as an analog-to-digital converter to provide the indicia data while in a second configuration.

13. The optical disc system of claim 1 wherein said signal processing system includes:

a PC;

a programmable digital signal processor coupled to said at least one information-carrying signal; and

an analyzer coupled between said programmable digital signal processor and said PC so that said analyzer provides said indicia data.

14. The optical disc system of claim 1 wherein the signal processing system further includes a trigger detection circuit that detects a time period during which the investigational feature associated with the optical disc assembly is scanned by said photo detector circuit.

15. The optical disc system of claim 1 wherein said signal processing system further includes a trigger detection circuit that detects a particular trigger time in relation to a respective time duration during which said indicia data is present in said at least one information-carrying signal, and each respective time duration occurs periodically with a respective investigational feature and a corresponding set of indicia data.

16. The optical disc system of claim 1 wherein said signal processing system includes a PC and an audio processing module coupled between said PC and said at least one information-carrying signal.

17. The optical disc system of claim 16 wherein said audio processing module is one of:

an external module independent of the optical disc drive;

a drive module that is a part of the optical disc drive; and

a modified drive module that is a part of the optical disc drive.

18. The optical disc system of claim 16 wherein said PC includes a processor coupled to said audio module, and a software module stored in a memory to control said processor to extract said indicia data from audio data.

19. The optical disc system of claim 1 wherein the photo detector circuit includes circuitry to generate an analog signal as said at least one information-carrying signal, said analog signal including one of a high frequency signal from a photo detector, a tracking error signal, a focus error signal, an automatic gain control setting, a push-pull tracking signal, a CD tracking signal, a CDR tracking signal, a focus signal, a differential phase detector signal, a laser power monitor signal, and a sound signal.

20. The optical disc system of claim 1 further comprising the optical disc assembly, wherein said optical disc assembly has disposed thereon the associated investigational feature in a first disc sector and has encoded thereon said operational information used to operate said optical disc drive in a remaining disc sector.

21. The optical disc system of claim 20 wherein said optical disc assembly comprises a reflective-type optical disc.

22. The optical disc system of claim 20 wherein said optical disc assembly comprises a transmissive-type optical disc.

23. The optical disc system of claim 20, wherein said optical disc assembly includes a trigger mark disposed thereon in a predetermined position relative to said first disc sector, and said signal processing system further includes a trigger detection circuit that detects said trigger mark.

24. The optical disc system of claim 23, wherein said trigger detection circuit detects said trigger mark periodically, and said trigger detection circuit detects said trigger mark at one of (i) a predetermined time in advance of, (ii) a time at, and (iii) a predetermined time after a time when a respective investigational feature is read by said photo detector circuit based on said predetermined position of said trigger mark relative to said first disc sector.

25. The optical disc system of claim 1 further comprising one or more additional photo detector circuits configured to generate at least one information-carrying signal from a respective optical disc assembly.

26. The optical disc system of claim 20 wherein said optical disc assembly comprises one or more reporters having an affinity for said associated investigational feature.

27. The optical disc system of claim 26 wherein said one or more reporters are individually selected from the group consisting of plastic micro-spheres, colloidal gold beads, silica beads, glass beads, latex beads, polystyrene beads, magnetic beads, and fluorescent beads.

28. An assay method comprising the steps of:

depositing a test sample at a predetermined location on an optical disc assembly;

spinning the optical disc assembly in an optical disc drive;

directing an incident beam onto the optical disc assembly;

detecting a return beam formed as a result of the incident beam interacting with the test sample; and

processing the detected return beam to acquire information about an investigational feature associated with the test sample.

29. The method of claim 28 wherein said optical disc assembly comprises one or more reporters having an affinity for investigational features in said test sample.

30. The method of claim 29 wherein said one or more reporters are individually selected from the group consisting of plastic micro-spheres, colloidal gold beads, silica beads, glass beads, latex beads, polystyrene beads, magnetic beads, and fluorescent beads.

31. The method of claim 28 wherein the step of detecting a return beam forms a plurality of analog signals.

32. The method of claim 28 further comprising the step of detecting a trigger mark associated with said optical disc assembly.

33. An assay method comprising the steps of:

depositing a test sample at a predetermined location on an optical disc assembly;

spinning the optical disc assembly in an optical disc drive;

directing an incident beam onto the optical disc assembly;

detecting a transmitted beam formed as a result of the incident beam interacting with the test sample and continuing through said disc assembly; and

processing the detected transmitted beam to acquire information about an investigational feature associated with the test sample.

34. The method of claim 33 further comprising the steps of detecting a reflected beam formed as a result of the incident beam interacting with the test sample, and processing the detected reflected beam to acquire information about an investigational feature associated with the test sample.

35. The method of claim 33 wherein said optical disc assembly comprises one or more reporters having an affinity for investigational features in said test sample.

36. The method of claim 35 wherein said one or more reporters are individually selected from the group consisting of plastic micro-spheres, colloidal gold beads, silica beads, glass beads, latex beads, polystyrene beads, magnetic beads, and fluorescent beads.

37. The method of claim 33 wherein the step of detecting a transmitted beam forms a plurality of analog signals.

38. The method of claim 33 further comprising the step of detecting a trigger mark associated with said optical disc assembly.

39. A method comprising steps of:

acquiring a plurality of analog signals from an optical disc assembly using one or more photo detectors;

summing a first subset of the plurality of analog signals to produce a sum signal;

combining a second subset of the plurality of analog signals to produce a tracking error signal;

obtaining information used to operate an optical disc drive from the tracking error signal; and

converting the sum signal to a digitized signal.

40. The method of claim 39 wherein the steps of acquiring and summing produce the sum signal, and the sum signal includes perturbations indicative of an investigational feature positioned at a location of the optical disc assembly.

41. The method of claim 39 further comprising a step of characterizing the investigational feature based on the digitized signal.

42. The method of claim 39 wherein the step of converting includes configuring a portion of an optical disc drive chip set to operate as an analog-to-digital converter.

43. The method of claim 42 wherein the step of configuring comprises programming a digital signal processing chip within said optical disc drive chip set to operate as an analog-to-digital converter.

44. The method of claim 43 wherein said digital signal processing chip includes a normalization function, an analog-to-digital converter function, a demodulation/decode function, and an output interface function.

45. The method of claim 44 wherein said step of configuring further comprises by-passing said sum signal around said demodulation/decode function by creating a path from said analog-to-digital converter function to said output interface function.

46. The method of claim 45 wherein said step of configuring further comprises deactivating said demodulation/decode function.

47. The method of claim 39, wherein said step of converting includes configuring a digital signal processing chip that includes a normalization function, an analog-to-digital converter function, a demodulation/decode function, and an output interface function; and said step of configuring comprises creating a path from said analog-to-digital converter function to said output interface function so that said sum signal is unprocessed by said demodulation/decode function.

48. The method of claim 47 wherein said step of configuring comprises deactivating said demodulation/decode function.

49. The method of claim 39 wherein said step of acquiring includes tapping one or more of said plurality of analog signals directly at said one or more photo detectors, and said step of converting includes directing said signals into an analog-to-digital converter.

50. The method of claim 49 wherein said step of converting further includes directing said analog signals from said one or more photo detectors into a buffer amplifier before processing by said analog-to-digital converter.

51. The method of claim 39 wherein said step of acquiring includes tapping one or more of said plurality of analog signals after processing by an optical disc drive chip set and said step of converting includes directing said signals into an analog-to-digital converter.

52. The method of claim 51 wherein said step of converting further includes directing said analog signals from said optical disc drive chip set into a buffer amplifier before directing said analog signals into said analog-to-digital converter.

53. A method comprising the steps of:

adapting a portion of a signal processing system to operate as an analog-to-digital converter;

acquiring a plurality of analog signals from a photo detector circuit of an optical disc drive, the plurality of analog signals including information therein that is indicative of investigational features on an optical disc assembly;

converting said analog signals into a digitized signal with said signal processing system; and

characterizing said investigational features based on said digitized signal.

54. The method of claim 53 wherein said step of adapting comprises programming a digital signal processing chip within said signal processing system to operate as the analog-to-digital converter.

55. A method comprising the steps of:

receiving each of at least one analog signal at a corresponding input of signal processing circuitry, said at least one analog signal having been provided by at least one corresponding photo detector element that detects light returned from a surface of an optical disc assembly; and

converting each of said at least one analog signal into a corresponding digitized signal, each digitized signal being substantially proportional to an

intensity of said returned light detected by a corresponding one of said at least one photo detector element.

56. The method of claim 55 wherein said step of converting includes operating the signal processing circuitry to bypass any demodulation of a first digitized signal.

57. The method of claim 56 wherein said step of converting further includes:

operating the signal processing circuitry to bypass any decoding of the first digitized signal; and

operating the signal processing circuitry to bypass any checking for errors in the first digitized signal.

58. The method of claim 55 wherein said step of converting includes operating the signal processing circuitry to bypass any decoding of a first digitized signal.

59. The method of claim 55 wherein said step of converting includes operating the signal processing circuitry to bypass any checking for errors in a first digitized signal.

60. The method of claim 55 further comprising a step of combining at least two of said at least one analog signal.

61. The method of claim 60 wherein said step of combining is a step selected from a group consisting of adding, subtracting, dividing, and multiplying, and any combination thereof.

62. The method of claim 61 wherein said step of combining is performed before said step of converting.

63. The method of claim 61 wherein said step of combining is performed after said step of converting.

64. The method of claim 55 wherein said step of receiving includes at least one analog signal provided by at least one corresponding photo detector element that detects light transmitted through an optical disc assembly.

65. The method of claim 55 wherein said step of receiving includes detection of a trigger mark indicative of a time period during which the investigational feature associated with the optical disc assembly is scanned by said at least one photo detector.

66. The method of claim 55 further comprising a step of supplying a first digitized signal of said at least one digitized signal at an output interface of the signal processing circuitry after said step of converting without substantially modifying said first digitized signal between said steps of converting and supplying.

67. The method of claim 66 wherein said signal processing circuitry comprises a digital signal processor.

68. The method of claim 66 wherein said signal processing circuitry comprises an external analog-to-digital converter.

69. The method of claim 68 wherein said signal processing circuitry further comprises a buffer amplifier before said external analog-to-digital converter.

70. A signal characteristic of information about an investigational feature located in an optical disc assembly, said signal generated by a process comprising the steps of:

depositing a test sample at a predetermined location on an optical disc assembly;

spinning the optical disc assembly in an optical disc drive;

directing an incident beam onto the optical disc assembly;

detecting a return beam formed as a result of the incident beam interacting with the test sample; and

processing the detected return beam to acquire information about an investigational feature associated with the test sample.

71. The signal generated by the process of claim 70 wherein said return beam is formed as a result of the incident beam interacting with one or more reporters having an affinity for investigational features in said test sample.

72. The signal generated by the process of claim 70 wherein the step of detecting a return beam forms a plurality of analog signals.

73. The signal generated by the process of claim 72 wherein the step of processing the detected return beam includes:

summing a first subset of the plurality of analog signals to produce a sum signal;

combining one of the first subset and a second subset of the plurality of analog signals to produce a tracking error signal;

obtaining information used to operate an optical disc drive from the tracking error signal; and

converting the sum signal to a digitized signal.

74. The signal generated by the process of claim 73 wherein the sum signal includes perturbations indicative of an investigational feature located at a location of the optical disc assembly.

75. The signal generated by the process of claim 73 wherein the step of converting includes configuring a portion of an optical disc drive chip set to operate as an analog-to-digital converter.

76. The signal generated by the process of claim 75 wherein the step of configuring comprises programming a digital signal processing chip within said optical disc drive chip set to operate as an analog-to-digital converter.

77. The signal generated by the process of claim 76 wherein said digital signal processing chip includes a normalization function, an analog-to-digital converter function, a demodulation/decode function, and an output interface function.

78. The signal generated by the process of claim 77 wherein said step of configuring further comprises passing said sum signal around said demodulation/decode function by creating a path from said analog-to-digital converter function to said output interface function.

79. The signal generated by the process of claim 78 wherein said step of configuring further comprises deactivating said demodulation/decode function.

80. The signal generated by the process of claim 73 wherein said step of converting includes directing said sum signal into an external analog-to-digital converter.

81. The signal generated by the process of claim 80 wherein said step of converting further includes directing said sum signal into a buffer amplifier prior to said external analog-to-digital converter.

82. The signal generated by the process of claim 73, wherein said step of converting includes configuring a digital signal processing chip that includes a

normalization function, an analog-to-digital converter function, a demodulation/decode function, and an output interface function; and said step of configuring comprises creating a path from said analog-to-digital converter function to said output interface function so that said sum signal is unprocessed by said demodulation/decode function.

83. The signal generated by the process of claim 70 wherein said step of detecting further comprises detecting a transmitted beam formed as a result of the incident beam interacting with the test sample and passing through said optical disc assembly.

84. The signal generated by the process of claim 70 wherein the step of detecting a return beam forms a plurality of analog signals and the step of processing the detected return beam includes:

summing a first subset of the plurality of analog signals to produce a sum signal;

combining a second subset of the plurality of analog signals to produce a tracking error signal;

obtaining information used to operate an optical disc drive from the tracking error signal; and

converting the sum signal to a digitized signal.

85. The signal generated by the process of claim 84 wherein the sum signal includes perturbations indicative of an investigational feature located at a location of the optical disc assembly.

86. The signal generated by the process of claim 84 wherein the step of converting includes configuring a portion of an optical disc drive chip set to operate as an analog-to-digital converter.

87. The signal generated by the process of claim 86 wherein the step of configuring comprises programming a digital signal processing chip within said optical disc drive chip set to operate as an analog-to-digital converter.

88. The signal generated by the process of claim 87 wherein said digital signal processing chip includes a normalization function, an analog-to-digital converter function, a demodulation/decode function, and an output interface function.

89. The signal generated by the process of claim 88 wherein said step of configuring further comprises passing said sum signal around said demodulation/decode function by creating a path from said analog-to-digital converter function to said output interface function.

90. The signal generated by the process of claim 89 wherein said step of configuring further comprises deactivating said demodulation/decode function.

91. The signal generated by the process of claim 84, wherein:

said step of converting includes configuring a digital signal processing chip that includes a normalization function, an analog-to-digital converter function, a demodulation/decode function, and an output interface function; and

said step of configuring comprises creating a path from said analog-to-digital converter function to said output interface function so that said sum signal is unprocessed by said demodulation/decode function.

92. A signal generated by a process comprising the steps of:

adapting a portion of a signal processing system to operate as an analog-to-digital converter;

acquiring a plurality of analog signals from a photo detector circuit of an optical disc drive, wherein the plurality of analog signals includes information therein that is indicative of investigational features on an optical disc assembly;

converting said analog signals into a digitized signal with said signal processing system; and

characterizing said investigational features based on said digitized signal.

93. The signal generated by the process of claim 92 wherein said step of adapting comprises programming a digital signal processing chip within said signal processing system to operate as the analog-to-digital converter.

94. The signal generated by the process of claim 92 wherein said step of acquiring includes tapping said analog signals prior to an optical drive buffer.

95. The signal generated by the process of claim 92 wherein said step of acquiring includes trigger mark signals indicative of a time period during which the investigational feature associated with the optical disc assembly is scanned by the photo detector circuit.

96. A method of detecting a signal within an optical disc system comprising the steps of:

generating an incident beam of known wavelength;

directing said beam onto an optical disc containing an investigational feature; and

receiving a return beam formed as a result of the incident beam interacting with the investigational feature.

97. The method of claim 96 wherein said optical disc comprises one or more reporters having an affinity for said investigational feature, said reporters being capable of interacting with said incident beam.

98. The method of claim 97 wherein said one or more reporters are individually selected from the group consisting of plastic micro-spheres, colloidal

gold beads, silica beads, glass beads, latex beads, polystyrene beads, magnetic beads, and fluorescent beads.

99. The method of claim 96 wherein said step of receiving further comprises receiving a transmitted beam formed as a result of the incident beam interacting with the investigational feature, and passing through said optical disc.

100. The method of claim 96 wherein said step of receiving involves use of one or more photo detectors.

101. The method of claim 100 wherein said step of receiving forms a plurality of analog signals for processing by a signal processing system.

102. The method of claim 101 wherein said signal processing system comprises an external analog-to-digital converter.

103. The method of claim 102 wherein said signal processing system further comprises a buffer amplifier.

104. The method of claim 103 wherein said analog signals are tapped prior to processing by an internal optical disc drive buffer circuit.

105. The method of claim 101 wherein said signal processing system comprises programmable digital signal processing circuitry.

106. The method of claim 101 wherein said signal processing system comprises audio processing circuitry.

107. A method of imaging an investigational feature comprising the steps of:

depositing an investigational feature at a predetermined location on an optical disc assembly;

spinning the optical disc assembly in an optical disc drive;

directing an incident beam onto the optical disc assembly;

detecting a return beam formed as a result of the incident beam interacting with the investigational feature;

processing the detected return beam to acquire information about an investigational feature; and

imaging said investigational feature based on said information.

108. The method of claim 107 wherein said optical disc assembly comprises one or more reporters having an affinity for investigational features in said test sample.

109. The method of claim 108 wherein said one or more reporters are individually selected from the group consisting of plastic micro-spheres, colloidal gold beads, silica beads, glass beads, latex beads, polystyrene beads, magnetic beads, and fluorescent beads.

110. The method of claim 107 wherein the step of detecting a return beam forms a plurality of analog signals, and said step of processing comprises converting said analog signals into a digitized signal.

111. The method of claim 110 wherein said step of processing involves a signal processing system.

112. The method of claim 111 wherein said signal processing system comprises an external analog-to-digital converter.

113. The method of claim 112 wherein said signal processing system further comprises a buffer amplifier.

114. The method of claim 111 wherein said signal processing system comprises programmable digital signal processing circuitry.

115. The method of claim 111 wherein said signal processing system comprises audio processing circuitry.

116. The method of claim 110 wherein the step of processing the detected return beam includes:

summing a first subset of the plurality of analog signals to produce a sum signal;

combining one of the first subset and a second subset of the plurality of analog signals to produce a tracking error signal;

obtaining information used to operate an optical disc drive from the tracking error signal;

converting the sum signal to a digitized signal; and

outputting said digitized signal.

117. The method of claim 116 wherein the step of outputting involves displaying the digitized signal on a monitor.

118. The method of claim 116 wherein the step of outputting involves playing the digitized signal as sound using speakers.

119. A kit for the detection of an investigational feature in a test sample, the kit comprising carrier means being compartmentalized to receive one or more optical discs.

120. The kit of claim 119 further comprising one or more containers, said containers comprising one or more agents selected from the group consisting of isolated nucleic acids, antibodies, proteins, reagents, and reporters.

121. The kit of claim 119 further comprising an optical bio-disc.

122. The kit of claim 119 further comprising a setup optical disc.

123. The kit of claim 119 further comprising a buffer amplifier card, said card being adapted to retrofit into an optical disc drive.

124. The kit of claim 119 further comprising a modified optical disc drive.

125. An optical analysis disc for detection of a signal element, comprising:

a substrate layer;

an operational layer associated with said substrate layer, said operational layer having operational information encoded therein; and

a signal element positioned relative to said operational layer, said signal element and said operational layer having optical or magnetic characteristics selected to provide a predetermined contrast therebetween to thereby provide a return signal indicative of distinctions between information associated with said operation layer and characteristics of said signal element.

126. The optical analysis disc according to claim 125 wherein said optical or magnetic characteristics include electrical or magnetic polarization state of said signal element and said operational layer.

127. The optical analysis disc according to claim 125 wherein said optical or magnetic characteristics include irradiance of said signal element and said operational layer.

128. An optical analysis disc for use in imaging a biological or medical investigational feature, comprising:

a substrate;

an operational layer associated with said substrate, said operational layer having encoded operational features positioned relative to each other at a specified track pitch; and

an investigational feature positioned relative to said operational layer, said investigational feature selected to be larger in size than a corresponding operational feature and at least as large in size as one-half of said track pitch to thereby provide at least one scan of said investigational feature as an incident beam tracks along said operational features.

129. The optical analysis disc according to claim 128 wherein rotational speed of the disc is controlled to produce a higher quantized resolution in the digitization of a return signal generated by the disc.

130. The disc according to claim 128 including logic to provide random access to preaddressed locations on the disc.

131. The disc according to claim 129 including logic to provide random access to preaddressed locations on the disc.

132. The method of claim 31 wherein said step of processing the detected return beam includes:

summing a first subset of the plurality of analog signals to produce a sum signal;

combining one of the first subset and a second subset of the plurality of analog signals to produce a tracking error signal;

obtaining information used to operate an optical disc drive from the tracking error signal; and

converting the sum signal to a digitized signal.

133. The method of claim 37 wherein said step of processing the transmitted beam includes:

summing a first subset of the plurality of analog signals to produce a sum signal;

combining one of the first subset and a second subset of the plurality of analog signals to produce a tracking error signal;

obtaining information used to operate an optical disc drive from the tracking error signal; and

converting the sum signal to a digitized signal.